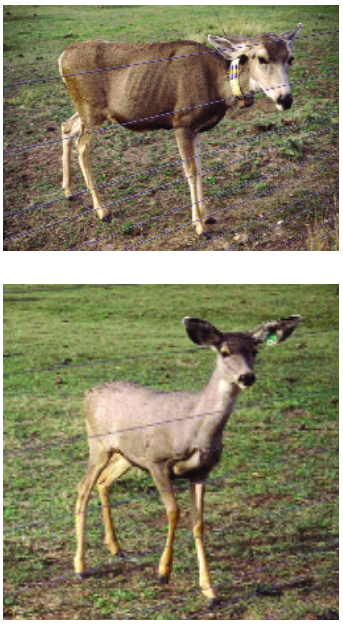
# Chronic wasting disease: An emerging infectious disease of concern

*by Margaret A. Wild*



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A fatal brain malady of unknown origin, chronic wasting disease has been documented in free-ranging elk and deer in several western and midwestern states. Sick animals (top, compare with healthy deer, bottom) are thin, lose their fear of humans, and develop a blank stare; additional signs of illness may include drooping ears; excessive salivation, drinking, and urination; and eventually tremors and incoordination.

"WEST NILE VIRUS APPEARS THROUGHOUT United States." "Amphibians decline due to Chytrid fungus." "Chronic wasting disease threatens deer and elk." Conservationists, hunters, public health officials, and the general public take note of such headlines because these emerging infectious diseases pose a threat to natural resources in various areas of the country, including national parks.

Chronic wasting disease is not a new discovery, but the attention focused on it in recent years is unprecedented in wildlife health management. The disease first appeared in Wyoming and Colorado, including Rocky Mountain National Park, more than 20 years ago. Although the origin of the disease is unknown, it is believed to be an exotic disease process that is the result of human intervention. Concern about chronic wasting disease increased with the recent detection of it in several new locations. Since 1997, chronic wasting disease has been found in 25 elk and deer farms throughout the United States and in free-ranging deer in Nebraska, South Dakota, Wisconsin, Illinois, and New Mexico. Increased surveillance will likely lead to identification of additional areas of infection in coming years.

Chronic wasting disease belongs to the family of fatal brain diseases known as transmissible spongiform encephalopathies. Related diseases include scrapie of sheep, bovine spongiform encephalopathy (mad cow disease), and human Creutzfeldt-Jakob disease. These diseases are not caused by viral or bacterial infections, but scientists have noted accumulations of abnormal prion proteins in the brains of affected animals.

NPS PHOTO BY DAN RODDY

Rocky Mountain National Park uses tonsillar biopsy of anesthetized deer to identify chronic wasting disease before symptoms appear.

Because of the unique nature of the disease agent, scientists have had to determine new methods for detection, diagnosis, and possible treatments.

Diagnosis of chronic wasting disease has traditionally been made using brain samples collected postmortem from deer and elk. New developments have led to a live animal test for deer using tonsillar biopsies obtained from anesthetized deer. Unfortunately this technique is not currently applicable to elk because of differences in the accumulation of prion protein in the tonsils of elk and deer. While this intensive testing approach is not practical for all management situations, it is being applied in Colorado's Rocky Mountain National Park and South Dakota's Wind Cave National Park, where chronic wasting disease is a significant threat to resources.

At other national parks, managers are encouraged to be on the lookout for the disease. It should be suspected in deer and elk more than 17 months old that are thin and exhibit behavioral abnormalities, such as loss of fear of humans. Additional clinical signs include a blank stare, drooping ears, excessive salivation, excessive drinking and urination, and, terminally, tremors or incoordination. Targeted surveillance, in which any deer or elk with clinical signs similar to those of chronic wasting disease are collected for diagnostic testing, is an effective and easily applied management technique.

Much remains to be learned about chronic wasting disease. The specific route and mechanism of disease transmission have not been identified, but are believed to be from animal to animal or contaminated environment to animal via saliva or feces. Although investigations have found no evidence that the disease occurs naturally in species other than deer and elk, the agricultural community and public remain concerned that domestic livestock or humans could become infected. Yet the disease itself and management actions to control it present a real threat to populations of deer and, to a lesser extent, elk. For these reasons chronic wasting disease will likely remain in the headlines and on the minds of conservationists for years to come. ■

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